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Process and device for manufacturing a product from strip tape, especially for manufacturing a medicinal and/or active substance-containing product as well as fillable containers or sealed-margin bags

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10 The invention relates to a process for manufacturing a product from strip tape, especially a medicinal and/or active substance-containing product such as, for example, dermal or transdermal patches or another administration form, for example for oral application, as well as fillable containers or sealed-margin bags, in which process there is used as starting material a broad, active agent-containing web of material, for instance of sheet-like materials and, 15 in particular, of active substance-containing sheeting or sheet-like active substance, said process comprising at least two of the following steps:

- 20 - separating the broad web of material into individual, narrow strips and, if necessary, winding the strips in individual coils or jointly twisting the strips.
- 25 - unwinding individual coils or pairs of coils, as required, and assembling at least two strips at a time to form a strip web, or unwinding the strip web wound up from individual strips.
- 30 - processing the web of material to form a product made-up of strip tape,
- 35 - performing final process steps as, for instance, manufacturing the final product, forming the final application form, laminating the carrier material, segregating, packaging etc.

For manufacturing the above-mentioned products, strip tape consisting of a plurality of individual strips is used. This tape is made by separating a coil of the starting material into individual strips, said coil having a width resulting from the number of strips multiplied by the width of the strips plus edge trimming.

Typically, the resultant strips are wound on reels and are jointly unwound in the number as required and assembled to form webs of material having at least two layers.

The manufacture of the stock reels is very labour-intensive, as is the winding and unwinding of the individual strips.

It is possible, here, that the material - which may be an active substance-containing material or a medicinal substance - is stretched impermissibly, with the unavoidable elongation of the material having a negative effect on the dosing accuracy of the medicinal substance.

It is the object of the present invention to provide a process and a device suitable for carrying out said process which overcome the aforementioned disadvantages, difficulties and technical limitations, and, in particular, enable the manufacture of a strip tape product, especially preferred an active substance-containing product, at reduced expenditure in respect of work and costs and without disadvantageous elongation of the material.

To achieve this object in a process of the kind mentioned at the outset, it is proposed according to the invention

- that a roll of material with a broad web of the starting material be mounted, loosely rotatable, on a take-up mandrel,

- that the web of material be drawn, in its entire width and without subjecting the material to tensile stress, from the roll of material by means of a vacuum roll,

or a device comprising two rolls, which unwinds the material gently from the material roll with one of the rolls simultaneously serving as a counter support to the cutting knives; the material being separated in the process into individual strips in the negative pressure zone of the vacuum roll by rolling a multiple circular knife roll,

- that at the end of the negative pressure zone of the vacuum roll or of the pair of rolls, each strip be drawn from the said vacuum roll or pair of rolls and be introduced in a take-up channel and continuously conveyed therein by means of negative pressure,
- that in the process each strip is turned on its way to the channel or through the channel by about 90°, and
- that at the end of the channels the strips be led one upon the other, at least two at a time, and thereafter conveyed in a, preferably open, groove for further processing under completion to form the final product, to a conversion equipment where the products are finished.

One embodiment of the process provides that for drawing the web of material and separating it into strips in co-operation with the multiple circular knife roll, there is used instead of a vacuum roll, a smooth stripping roll cooperating in a zone where the web of material travels around the roll with a pressure roll and a guide roll.

A device for the manufacture according to the present invention of a product from strip tape, especially of a medicinal and/or active substance-containing product such as, for example, a dermal or transdermal patch or another administration form, for example for oral application, as

well as fillable containers or sealed-margin bags,
especially for carrying out the process according to the
invention,

5 is characterized in that:

10 - as a means for drawing off and separating the web of material a vacuum roll is provided, in whose web-travelling zone the web of material, held by the negative pressure, can be severed into individual strips in cooperation with the multiple circular knife roll,

15 - to each strip there is associated a vacuum conveyor channel which is designed such that each strip is turned on its way to the channel or through the channel by about 90°, and

20 - the ends of all the take-up channels 12 are brought together at one site to form a unit and that at that site there are provided guide means and transport means for the further transport to a conversion equipment.

25 One embodiment of the device according to the invention provides that as means for drawing the web of material and for transport during the separation into strips in co-operation with the multiple circular knife roll, there is provided instead of a vacuum roll, a smooth stripping roll arranged in a zone where the web of material travels around the roll and adapted to cooperate with a pressure roll and
30 a guide roll.

The process according to the invention and the device provided for carrying out the same overcome the aforementioned disadvantages, difficulties and technical
35 limitations of the prior art and, in particular, enable the manufacture of medicinal and/or active substance-containing

products at reduced expenditure in terms of work and costs without disadvantageous elongation of the starting material.

Further details, features and advantages of this invention will become apparent from the following explanation of an embodiment example which is schematically illustrated in the figures.

The figures show:

- Fig. 1: a side view of the device
- Fig. 2: a plan view of the device according to Fig. 1
- Fig. 3: a partial view of the device with vacuum transport channels disposed at the end of the device.
- Fig. 4: a view of the device in which a smooth stripping roll is provided instead of a vacuum roll.

The part of the device represented in Fig. 1 shows rolls of material 1 with a web 2 of the starting material in a duplicate arrangement on both sides of a plane of symmetry x-x, said rolls 1 being mounted on take-up mandrels 3, as well as a duplicate arrangement of vacuum rolls 4, and circular knife rolls 5 rolling on said vacuum rolls 4 and the web of material 2 and having a plurality of parallelly disposed circular knives.

The same device is shown in Fig. 2 in plan view, with rolls of material 1, mounting mandrel 3, the material web 2, which can be uncoiled, vacuum rolls 4, circular knife rolls 5, and strips of material 6 cut from the web 2 and running off the said circular knife rolls 5 at the end of the vacuum zone.

Fig. 3 shows, in part in side view and in part in plan view, a vacuum roll 4. However, this may also be a stripping roll 8 aided by a guide roll 11, from which

strips 6, cut by a circular knife roll (not shown), are transported in the width of the original web of material 2. For linear take-off of a plurality of strips 6 there are provided vacuum conveyor channels 12, each formed, for example, between two cover plates 13 and 14.

Finally, Fig. 4 shows an alternative embodiment of the device wherein as means for drawing the material web 2 and for transport thereof during separation of the web of material in strips 6 in cooperation with a multiple circular knife roll 5 there is provided instead of a vacuum roll a smooth stripping roll 8 which is arranged in a zone in which the material web 2 travels around the roll and is adapted so as to cooperate with a pressure roll 10 and a guide roll 11.

The process and device are uncomplicated, reduce the expenditure of work and costs required heretofore, and enable the manufacture from strip tape of medicinal and/or active substance-containing products of various design, or of fillable containers or sealed-margin bags, while avoiding a disadvantageous elongation of the material, and, in particular, using a starting material in the form of sheet-like material, preferably a sheet-like active substance-containing administration form.

The present invention thus constitutes an optimal solution to the task presented at the outset.